

**REMARKS**

**OFFICE COMMUNICATION CONCERNING THIS APPLICATION OR PROCEEDING**

The previous amendment of April 13, 2009 was filed along with a Request for Continued Examination (RCE) in response to a Final Office Action dated January 14, 2009. In this previous amendment of April 13, 2009, claims 1, 3-8, 11-13, 15-18, 20-25, 28-30, and 32-34 were cancelled without prejudice, and new claims 35-42 were added. Claims 2, 9, 10, 14, 19, 26, 27, and 31 were previously canceled without prejudice.

The Office communication concerning this application or proceeding dated June 23, 2009 alleged that said previous amendment was non-responsive “because of the cancellation of the previous claims and addition of the new claims... directed towards the different subject matter that was not presented in the originally examined claims.” An extendible one-month deadline was given to submit a response.

While it is believed that the issuance of the Office communication is without merit, this present reply is nevertheless being filed herewith in order to be responsive and to facilitate prosecution.

In this reply, claims 13, 15-17, 30, and 32-34 (which were previously cancelled in the amendment of April 13, 2009) are being re-submitted herein in amended form. It is believed that such amended claims 13, 15-17, 30, and 32-34 can be presented herein using their original claim numbering sequence (without having to re-submit their subject matter using new claim numbering), since the amendment of April 13, 2009 was deemed to be non-responsive and hence the claim cancellations and claim additions therein presumably were not entered.

Claims 1, 3-8, 11, 12, 18, 20-25, 28, and 29 are cancelled herein without prejudice.

It is respectfully submitted that new claims 35-42 can be entered and examined along with claims 13, 15-17, 30, and 32-34.

With this reply, claims 13, 15-17, 30, 32-34, and 35-42 are pending in the application. No new matter is added and reconsideration of the application is respectfully requested.



### **DOUBLE PATENTING**

In “Double Patenting” on page 4 of the Final Office Action, claims 1, 3-8, 11-13, 15-18, 20-30, and 32-34 were rejected on the grounds of non-statutory obviousness-type double patenting as being unpatentable over claims 1-29 of copending application No. 10/840,601.

Claims 1, 3-8, 11, 12, 18, 20-25, 28, and 29 have been cancelled, which renders their rejections moot.

Applicant respectfully requests any double-patenting rejections based on the copending application No. 10/840,601 to be held in abeyance until the scope of the claims in either of the present application or the co-pending application are settled.

### **CLAIM REJECTIONS UNDER 35 U.S.C. § 102**

In “Claim Rejections – 35 U.S.C. §102” on pages 5 of the Final Office Action, claims 1, 3, 18, and 20 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Kisel et al., “Maximum Likelihood Approaches for Noncoherent Communications with Chaotic Carriers,” IEEE Transaction on Circuits and Systems-I: Fundamental Theory and Applications, Vol. 48, No. 5, May 2001 (hereinafter “IEEE article”).

Claims 1, 3, 18, and 20 have been cancelled, which renders such rejections moot.

### **CLAIM REJECTIONS UNDER 35 U.S.C. § 103**

In “Claim Rejections – 35 U.S.C. §103” on pages 6-7 of the Final Office Action, claims 6, 7, 23, and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the IEEE article.

Claims 6, 7, 23, and 24 are cancelled, which renders such rejections moot.

In “Claim Rejections – 35 U.S.C. §103” on pages 7 of the Final Office Action, claims 4, 5, 8, 11-13, 15-17, 21, 22, 25, 28-30, and 32-34 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the IEEE article in view of U.S. Patent No. 6,661,831 (hereinafter “Umeno”) and further in view of Alfred J. Menezes, Paul C. van Oorschot, Scott



A. Vanstone, "Handbook of applied cryptograph," 1997, ISBN:0849385237 (hereinafter "Menezes").

Claims 4, 5, 8, 11, 12, 21-25, 28, and 29 have been cancelled in this paper, which renders their rejections moot. Regarding claims 13, 15-17, 30, and 32-34, Applicant respectfully traverses the rejections.

On page 2, item 5 of the "Response to Amendment" section of the above-identified Final Office Action, the Examiner stated that Figure 7 and related text, especially the structure presented on the leftside of Figure 7 in the IEEE article discloses a  $k^{th}$ -chaotic signal generator having a chaotic characteristic value associated with a chaotic algorithm. On page 3, item 7 of the "Response to Amendment" section of the above-identified Final Office Action, the Examiner read the likelihood measures  $\gamma_1$  and  $\gamma_2$  in the IEEE article as the characteristic values evaluated and matched to determine the transmitted value. Applicants respectfully disagree with such reading based on the recitation of amended claim 13.

The IEEE article discloses a non-coherent communication scheme with chaotic carriers and noise cleaning capabilities. In Fig. 7 of the IEEE article, a CSK modulation-demodulation system having two chaotic signal generators 1 and 2 (on the left side of the figure) is illustrated. On page 538 of the IEEE article, it is described that "according to a binary information to be transmitted, a switch (as illustrated in Figure 7) connects either the output of generator 1 or 2 to the channel."

The Examiner's reading identified above indicates that the Examiner has deemed the chaotic signal generators 1 and 2 and the transmitted binary data in the IEEE article as the M chaotic signal generators and the digital message recited in claim 13 of the instant application. It is also indicated that the Examiner read the equation of chaotic signal generators 1 and 2 in the IEEE article as the algorithm recited in claim 13 of the instant application.

Even if assuming *arguendo* that the likelihood measures  $\gamma_1$  or  $\gamma_2$  in the IEEE article could be read as the "chaotic characteristic value of the received chaotic signal," in claim 13 (a reading with which Applicant disagrees), the likelihood measures  $\gamma_1$  and  $\gamma_2$  are not



determined based, at least in part, on the equations of the chaotic generators<sup>1</sup> assumed by the Examiner as the chaotic algorithm. Instead, according to pages 535 and 539 of the IEEE article, the likelihood measures  $\gamma_1$  and  $\gamma_2$  are products of “state transition probabilities times conditional observation probabilities” and are calculated based on their own equations<sup>2</sup>.

Second, even if assuming *arguendo* that there is a chaotic characteristic value of generators 1 and 2 associated with their equations in the IEEE article, for example “ $\alpha$ ” in the equation of chaotic signal generators with a skew tent map, and such a value could be read as the chaotic characteristic value of the chaotic signal generator (a reading with which Applicant disagrees), the IEEE article fails to disclose determining the “ $\alpha$ ” value of the received chaotic signal based on the equation of the generator 1 or 2 and matching the determined “ $\alpha$ ” value with the “ $\alpha$ ” values stored in the VD which is deemed by the Examiner as the receiver of the chaotic signal. In contrast, as described on page 539 of the IEEE article, only the likelihood measures  $\gamma_1$  and  $\gamma_2$  are compared with each other in order to determine whether the bit value associated with generator 1 or 2 is transmitted.

Accordingly, Applicant submits that the IEEE article fails to teach each and every element of independent claim 13.

Umeno was cited to read on inputting a random number to generate a first chaotic number, and Menezes was cited to read on generating a second chaotic number and repeating the step of using the second chaotic number as a first chaotic number until all numbers to be transmitted are generated. None of Umeno and Menezes cures the above stated deficiency of the IEEE article. Thus, the combination of the IEEE article and Umeno and Menezes fails to teach or suggest each and every element of claim 13.

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<sup>1</sup> On page 536-537 and in Figure 3 and 4 of the IEEE article, several types of generators are disclosed, such as

$$x_n = \frac{2}{2\alpha + 1} x_{n-1} + \frac{1 - 2\alpha}{2(1 + 2\alpha)} \text{ if } \frac{-1}{2} \pi x_{n-1} \leq \alpha;$$

the ones with a skew tent map

$$x_n = \frac{2}{2\alpha - 1} x_{n-1} - \frac{1 - 2\alpha}{2(2\alpha - 1)} \text{ if } \alpha \pi x_{n-1} \leq \frac{+1}{2}$$

; or the ones with a M-

Bernouilli shift map  $x_n = [M_1(x_{n-1}) + 1] \bmod 1 - 1/2$ .

<sup>2</sup> On page 539 of the IEEE article, the two likelihood measures are described as

$$\gamma_1 = \prod_{k=1}^N p(s_k | (s_{k-1}, M_1)) p(y_k | s_k) \quad \gamma_2 = \prod_{k=1}^N p(s_k | (s_{k-1}, M_2)) p(y_k | s_k)$$



Dependent claim 30 and newly added independent claims 35 and 39 include, at least in part, similar recitations as claim 13. Claims 15-17, 32-24, 36-38, and 40-42 depend from claim 13, 30, 35, or 39, incorporating their recitations respectively. Thus, due to at least the above-stated reasons, claims 15-17, 30, and 32-42 are patentable over the IEEE article in view of Umeno and Menezes under 35 U.S.C. § 103(a).

### **CONCLUSION**

In view of the foregoing, the Applicant submits that all pending claims are in a condition for allowance. Accordingly, a Notice of Allowance is respectfully requested. If the Examiner has any questions concerning the present paper, the Examiner is kindly requested to contact the undersigned at (206) 407-1542. If any fees are due in connection with filing this paper, the Commissioner is authorized to charge the Deposit Account of Schwabe, Williamson and Wyatt, P.C., No. 50-0393.

Respectfully submitted,  
SCHWABE, WILLIAMSON & WYATT, P.C.

Date: July 22, 2009 by: /Linda S. Zachariah /  
Linda S. Zachariah  
Reg. No.: 48,057

Schwabe, Williamson & Wyatt, P.C.  
1420 5<sup>th</sup> Avenue Suite 3010  
Seattle, WA. 98101  
Telephone: 206-622-1711